

(No Model.)

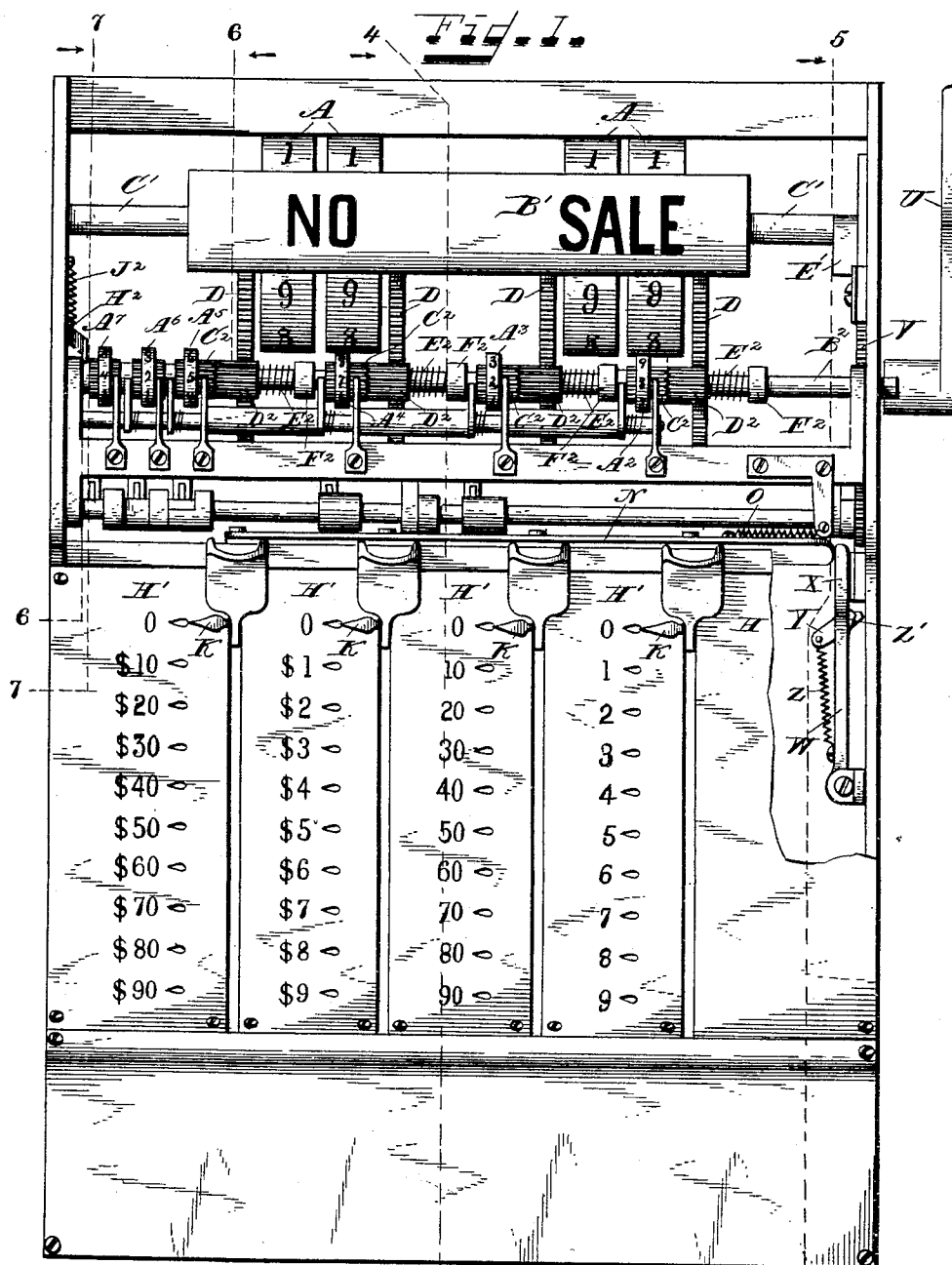
3 Sheets—Sheet 1.

J. PFEIFER.

CASH REGISTER, INDICATOR, AND RECORDER.

No. 479,720.

Patented July 26, 1892.



Witnesses.

Thomson Cross

E. W. Hardinghaus

Inventor.

John Pfeifer
by Peter Rector
his Attorneys.

(No Model.)

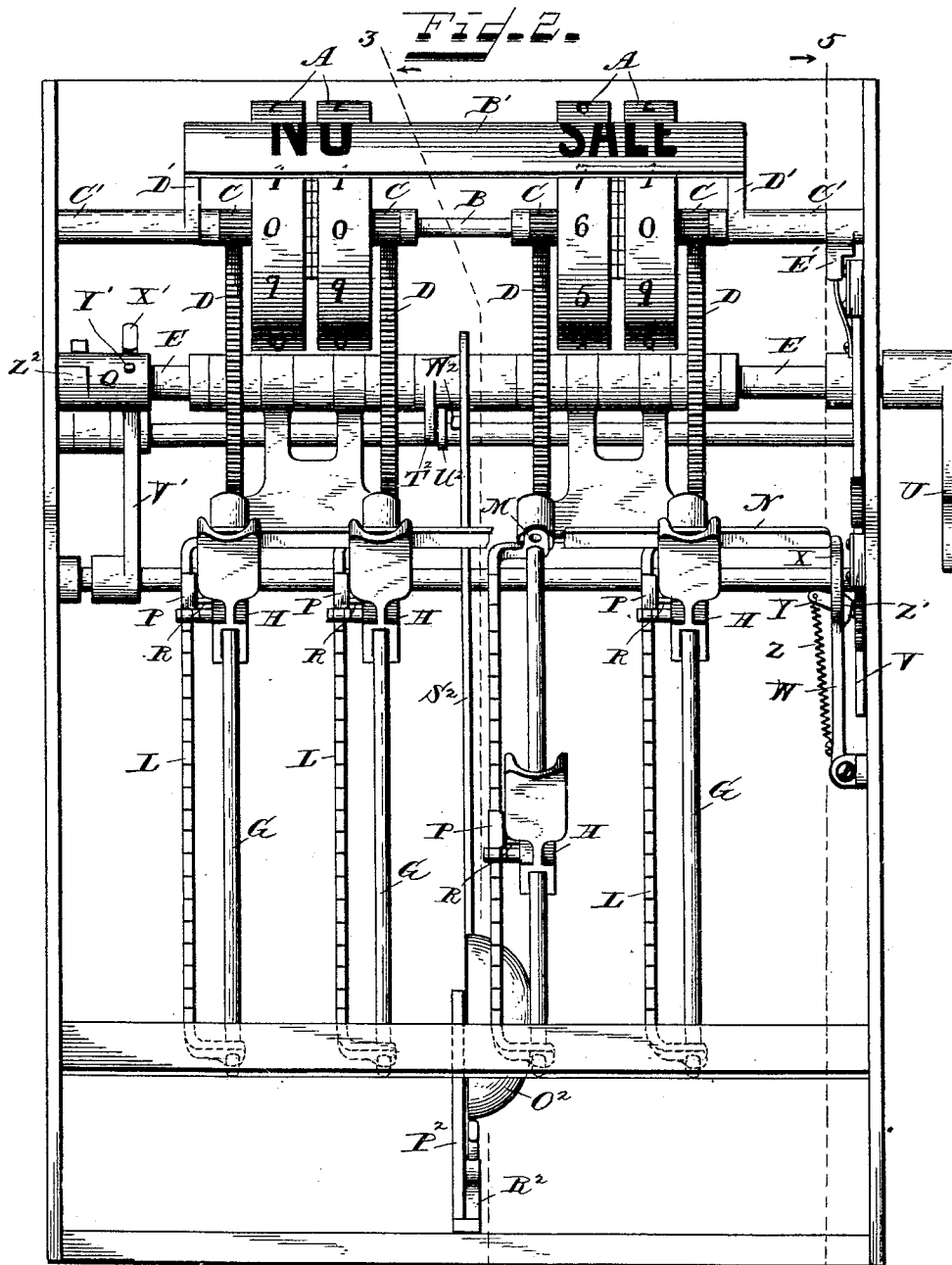
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Witnesses.

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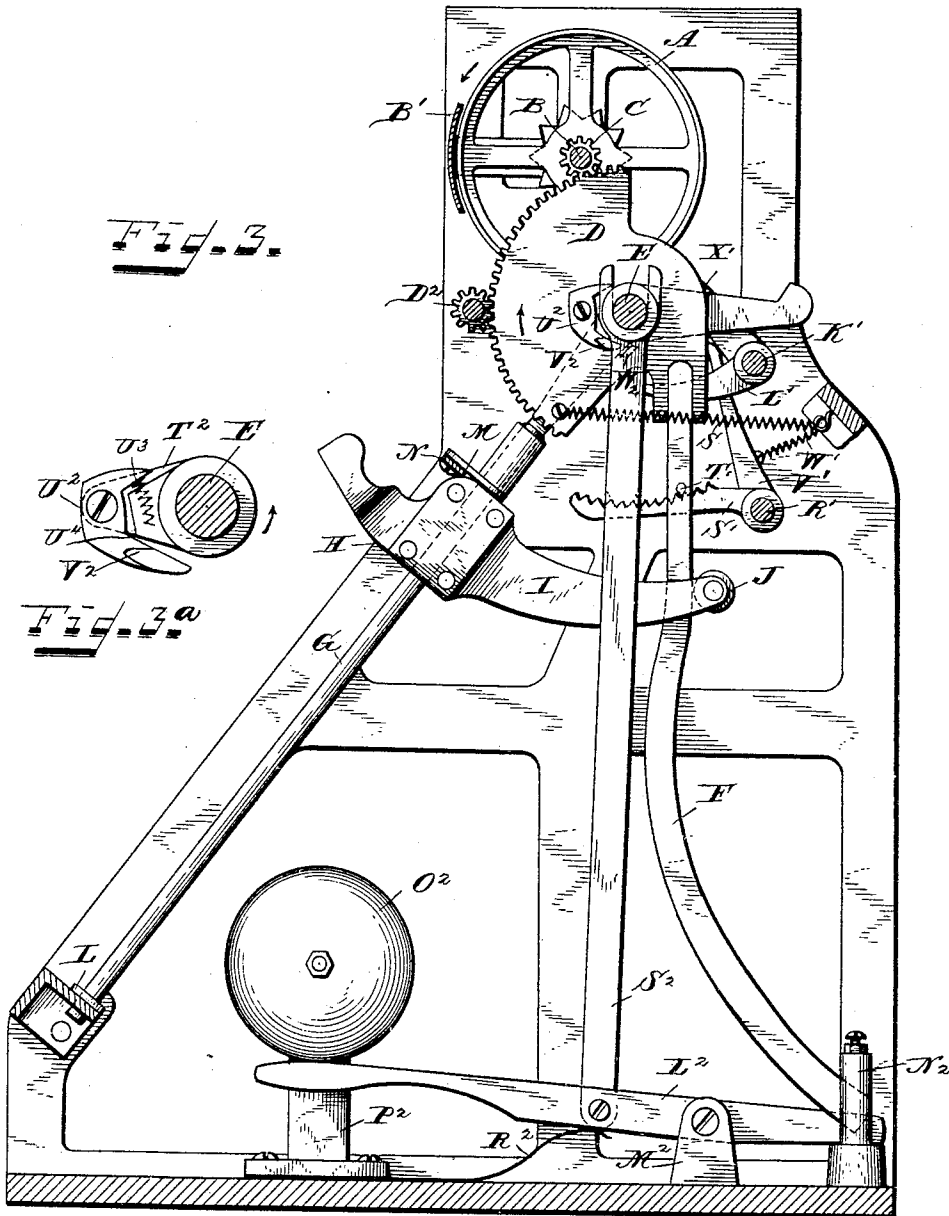
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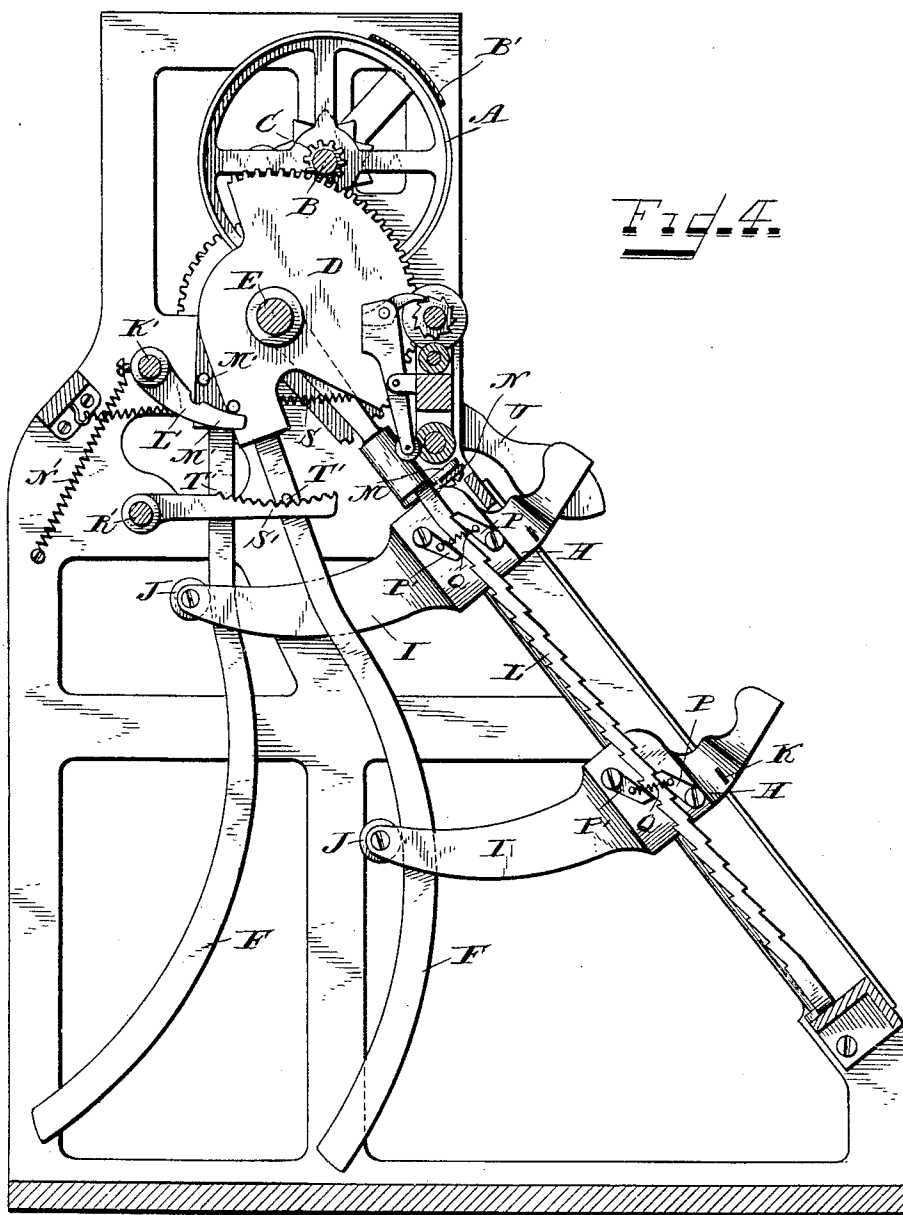
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J. PFEIFER.

CASH REGISTER, INDICATOR, AND RECORDER.

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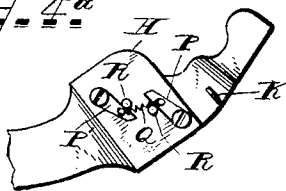
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Fig. 4^a



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(No Model.)

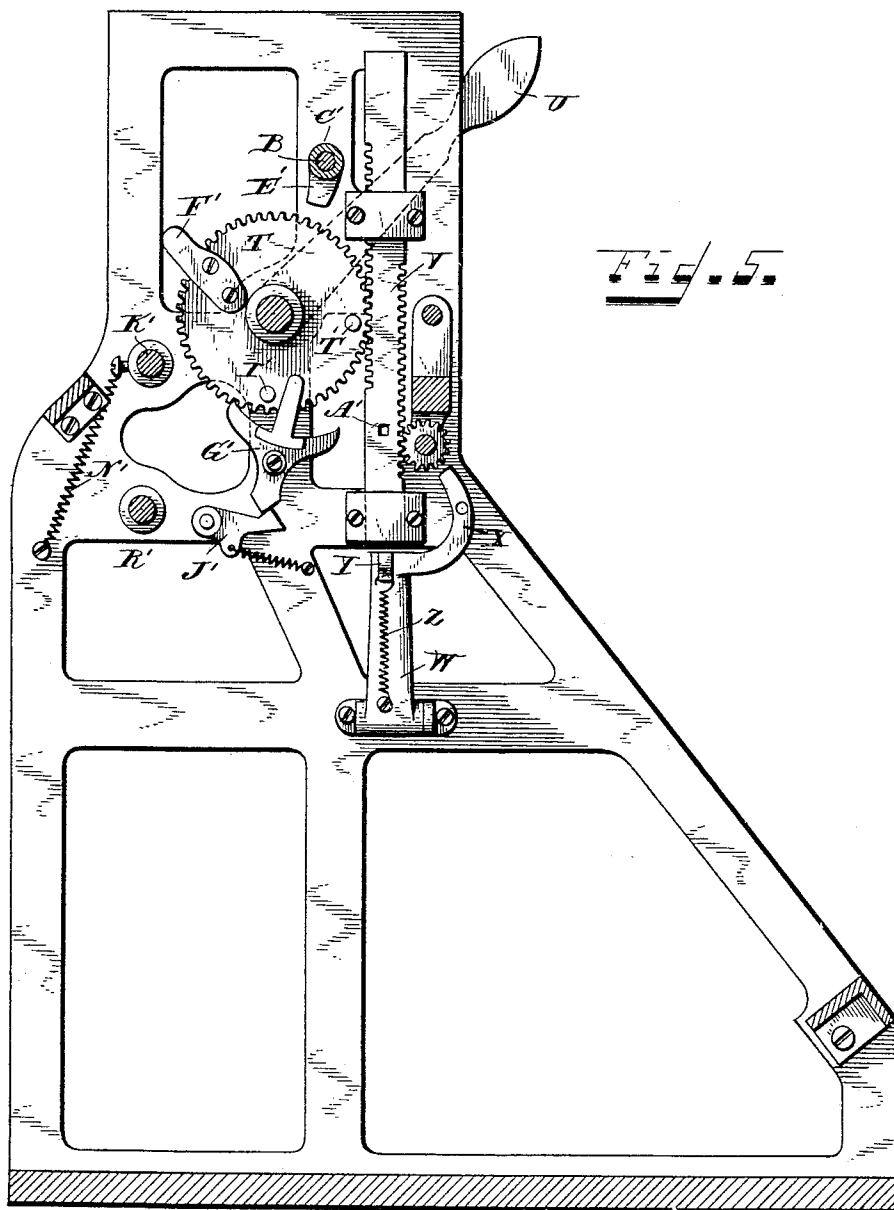
6 Sheets—Sheet 5.

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CASH REGISTER, INDICATOR, AND RECORDER.

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Witnesses.

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Fig. 5.

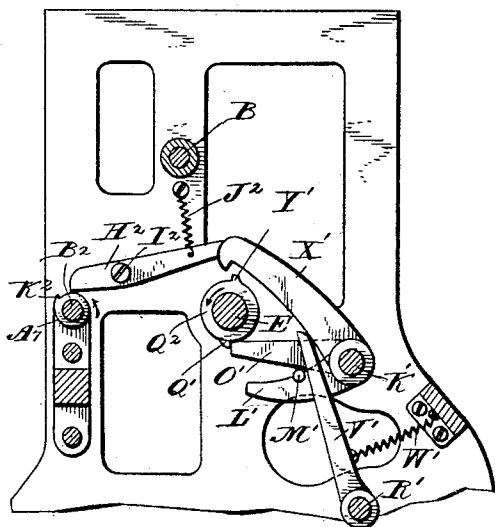


Fig. 7.

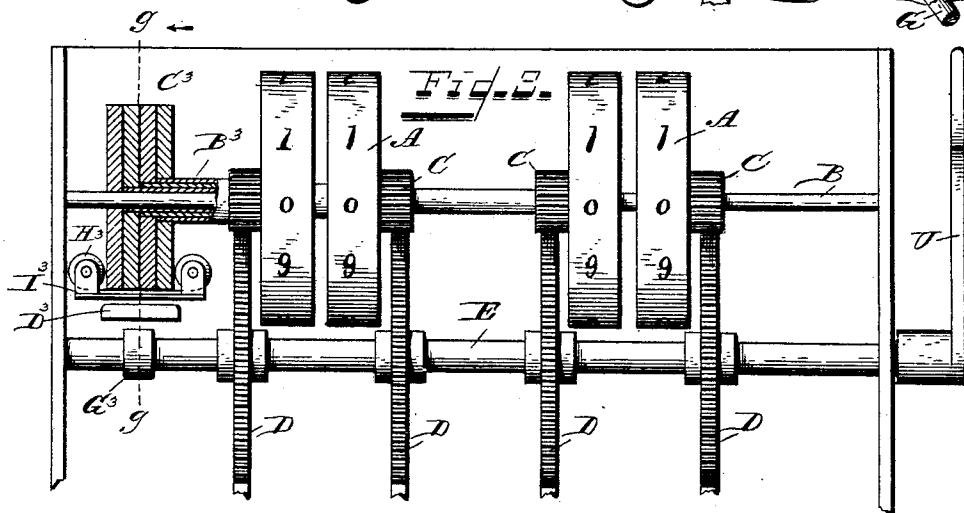
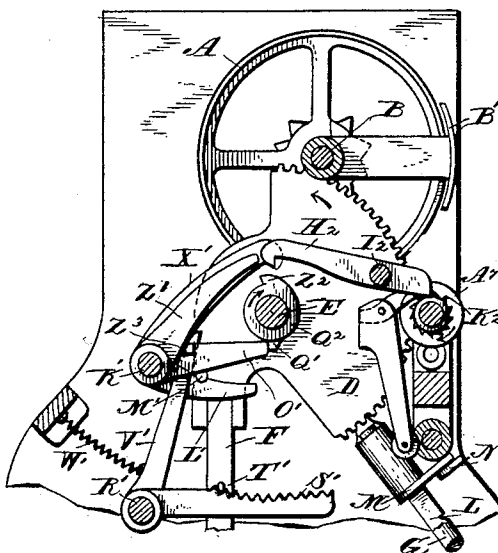
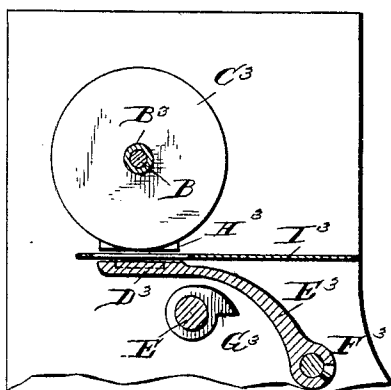


Fig. 9.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN PFEIFER, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CASH REGISTER, INDICATOR, AND RECORDER.

SPECIFICATION forming part of Letters Patent No. 479,720, dated July 26, 1892.

Application filed February 26, 1892. Serial No. 422,881. (No model.)

To all whom it may concern:

Be it known that I, JOHN PFEIFER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

10 The object of my invention is to produce a simple, cheap, and efficient machine of this class; and its novelty consists in new combinations, constructions, and modes of operation, as will be herein set forth, and specifically pointed out in the claims.

15 In the accompanying drawings, Figure 1 is a front elevation of my improved machine with the upper part of the casing removed, the indicators at "0," and the hand-lever in its upper position. Fig. 2 is a front elevation of the machine with all of the casing and the registering mechanism removed, with one key moved to make an indication, and with the hand-lever in its lower position; Fig. 3, a vertical section of the machine on the line 3 3 of Fig. 2 with all the indicators at "0" and the hand-lever in its upper position; Fig. 3^a, an enlarged detail of part of the drawer-releasing and gong-sounding mechanism; Fig. 4, a vertical section on the line 4 4 of Fig. 1, but with a key operated and the hand-lever in its lower position; Fig. 4^a, a detail side view of one of the keys and its pawls; Fig. 5, a vertical section on the line 5 5 of Figs. 1 and 2 with the hand-lever up; Fig. 6, a vertical section of the upper part of the machine on the line 6 6 of Fig. 1; Fig. 7, a vertical section of the upper part of the machine on the line 7 7 of Fig. 1; Fig. 8, a front view of the upper part of the machine, showing the application of a printing attachment; and Fig. 9 a vertical section on the line 9 9 of Fig. 8.

The same letters of reference are used to indicate identical parts in all the figures.

45 The indicator-wheels A are loosely mounted on a shaft B in the upper part of the machine. They are four in number in this instance, representing, respectively, units of cents, tens of cents, units of dollars, and tens of dollars, and each bearing upon its face a cipher and the nine digits. Fast upon or rigid with each

of these wheels is a pinion C, which meshes with a gear-toothed sector D, loosely mounted upon a shaft E, Figs. 3 and 4, there being four sectors, one for each wheel. Integral with or rigidly secured to each sector is a pendent curved arm F, extending nearly to the bottom of the machine. Mounted in the framework at the front of the machine are four inclined guide-rods G, one substantially in line with each of the arms F and sectors E. Upon these rods G slide the operating keys or handles H, one upon each rod. Each of these keys or handles consists of a suitable body portion embracing the rod and carrying friction-rollers bearing thereon, a forwardly-projecting finger-piece, and a rearwardly-projecting arm I. This arm I is slotted at its rear end and embraces one of the curved sector-arms F and carries a friction-roller J, which bears against the rear side of said arm. Under this construction it will be seen that whenever any one of the keys H is slid downward upon its forwardly-inclined guide-rod the arm F, which is connected to it, will be gradually drawn forward and the sector E moved upward and rearward. This will cause the indicator-wheel A, which is geared to the sector, to be turned forward and its numbers will successively and in order pass the reading point or window in the casing of the machine. As seen in Fig. 1, the forward-inclined side of the casing has four slots or spaces, between the plates of which it is composed, through which slots or spaces the shanks of the keys H pass and have their play. Beside each of these slots is placed an index H', representing the numbers to be indicated and registered by the adjacent key on the right, and each key carries a laterally-projecting pointer K, arranged to move over its index. The adjustment of the parts is such that when any key is pulled downward until its pointer stands opposite a given number upon its index the arm F, connected to that key, will be drawn forward just far enough to cause its sector to turn the corresponding indicator to position to expose such number at the reading-opening in the casing of the machine.

Beside each of the guide-rods G, parallel therewith and extending the full length thereof, is a ratchet-bar L, having the teeth upon

its upper and lower sides facing in opposite directions, as seen in Fig. 4. Each of these bars has its opposite ends bent to the right at right angles to the body of the bar, and by these bent ends it is hung upon the adjacent guide-rod G, the latter passing through holes in the ends of the bar, as seen in Fig. 2. The ratchet-bar is thus free to swing up and down upon and parallel with its supporting guide-rod G. The upper end of each ratchet-bar is not only bent to the right, but is widened or extended upward, as seen in the case of the second bar in Fig. 2 and also in Fig. 7, to form a bell-crank plate M, with the rod G as its pivot. It results from this that when the upper end of the plate M is moved to the left the body of the ratchet-bar will be thrown downward, and vice versa. A horizontal bar N, Fig. 2, extends across the machine at the upper ends of the rods G and bars L and the upper end of each bell-crank plate M is pivoted to it. When the bar N is moved to the left, therefore, all of the ratchet-bars will be thrown downward, and when it is moved to the right they will be lifted. A spiral spring O, Fig. 1, connected at one end to the framework and at its other to the bar N, pulls the bar to the right and yieldingly holds all of the ratchet-bars in their upper position. Upon the left-hand side of the body of each of the keys H are pivoted two pawls P and P', Fig. 4, the former co-operating with the teeth upon the upper side of the bar and the latter with the teeth upon its lower side. These two pawls are connected by a spring Q, tending to press them into engagement with the ratchets; but stop-pins R, Fig. 4^a, upon the side of the body of the key limit the movement of the pawls under the stress of the spring, so that when the ratchet-bar is thrown downward to its full limit of movement the upper pawl P will be entirely freed from the upper ratchet, and when it is thrown upward to its limit of movement the pawl P' will be entirely freed from the lower ratchet. In Fig. 4 both pawls are shown in engagement with the ratchet-bar, which will be hereinafter explained.

When the bar N is held to the right by its spring O and the ratchet-bars L are all in their upper positions, the keys H are free to be pulled downward, their pawls P' being free from the lower ratchets and their pawls P slipping over the teeth of the upper ratchets; but the engagement of the pawls P with the upper ratchets will prevent any backward movement of the keys. When, therefore, any key is pulled downward until its pointer stands opposite a given number upon its index, that number will be indicated by the corresponding wheel A, and the key will be caught and held at that point when the finger of the operator is removed from it and the number on the indicator will remain exposed to view. When the ratchet-bar is thrown downward to its limit of movement, by moving the bar N to the left to its limit of move-

ment the upper ratchet will be disengaged from the pawl P and the lower ratchet engaged with the pawl P'. The key is thereupon free to be moved upward to normal position, but cannot be pulled farther downward. When started back to normal position, too, the engagement of the pawl P' with the successive teeth of the lower ratchet will prevent retrograde movement at any point, so that the key must be returned entirely to normal position before it can be again operated.

Each of the sectors D has connected to it the forward end of a spring S, Fig. 3, whose rear end is secured to the framework. This spring tends to pull the lower end of the sector and its arm F rearward and yieldingly hold them in the position shown in Fig. 3, with the indicator-wheel standing at "0." The strain of these springs, exerted upon the keys H through the arms F and I, will cause the keys to be slid upward upon their rods G to normal position whenever their pawls P are disengaged from the ratchets upon the upper sides of the bars L. When, therefore, one or more keys have been pulled downward and caught, as in the case of the second key in Fig. 2, to make an indication and registration, and the bar N is then moved to the left to its limit of movement, and the ratchet-bars L thereby thrown downward, all of such keys will be released and the springs S will restore them to normal position and reset the indicator-wheels to "0."

The bar N is moved to the left to release the operated keys in the manner and by the means to be now described.

Fast upon the right-hand end of the shaft E, just within the side frame of the machine, is a gear-wheel T, Fig. 5, (or it may be simply a gear-toothed sector,) while fast upon the end of the shaft outside the frame is a hand-lever U. The gear T meshes with a vertical rack-bar V, mounted to slide up and down in suitable guides. When the end of the hand-lever is thrown down, the rack-bar is moved downward, and vice versa. Pivoted at its lower end to the framework is an arm W, Figs. 1, 2, and 5, having an outwardly and upwardly curved extension X, Fig. 5, whose upper end bears against the right-hand end of the bar N, heretofore described, as seen in Figs. 1 and 2. When the upper end of the arm W is thrown to the left, therefore, the bar N will be forced in that direction and the ratchet-bars L all thrown downward. Pivoted in a slot in the upper end of the arm W is a trip Y, whose nose projects to the right beyond the face of the bar, as seen in Figs. 1 and 2, and to whose opposite end is connected a spring Z, tending to pull that end of the trip downward and hold the trip in the position shown in Fig. 1. When the parts are in the position shown in Figs. 1 and 5, the nose of the trip projects beneath the lower end of the rack-bar V. The arm W has also upon its outer side at its upper end a beveled projection Z', which stands below the end of the

rack-bar V. When the bar is moved downward by the depression of the hand-lever, its lower end, riding over the beveled projection Z' on the arm W, forces said arm, and consequently the bar N, slightly toward the left. This movement of the bar N is not sufficient to throw the ratchet-bars L far enough downward to disengage their upper ratchets from the pawls P and release the keys; but it is sufficient to move their lower ratchets into engagement with the pawls P', the result being that both pawls of each key are now engaged with its ratchet-bar, as seen in Fig. 4, and the key is positively locked from movement in either direction. The lower end of the rack-bar as it has moved downward has depressed the nose of the trip Y and flipped up its opposite end, and the trip remains in this position until a hole in the rack-bar at A', Fig. 5, comes opposite the nose of the trip, whereupon the latter flips into it and the trip assumes the position shown in Fig. 2. At the beginning of the return upward movement of the bar the nose of the trip is carried upward by the hole A' in the bar as far as the play of the trip in its bearings will permit, and then as the nose is forced out of the hole in the bar and bears against the face of the bar below said hole the arm W and the bar N will be forced still farther to the left, depressing all of the ratchet-bars L still further and releasing the operated keys, which will thereupon be restored to normal position in the manner before explained. When the rack-bar V has been lifted to the position shown in Figs. 1 and 5 and its lower end carried above the beveled projection Z' and nose of the trip, the arm W will be released and the bar N will be thrown to the right again by the spring O, thereby lifting all the ratchet-bars L, disengaging their lower ratchets from the pawls P', and engaging their upper ratchets with the pawls P, ready for new operations of the keys.

Supported at its opposite ends by arms D', projecting from sleeves C', loose upon the shaft B, is a screen-plate B', Figs. 1 and 2, extending across the series of indicator-wheels. Fast upon the right-hand end of the right-hand sleeve C' is a pendent arm E', which co-operates with an arm F, fast on the gear T, Fig. 5. When the hand-lever is thrown down to its lowest position, the arm F' strikes the arm E' and throws the screen-plate up to the position shown in Fig. 2, thereby exposing the numbers on the indicator-wheels to view. When the hand-lever is thrown upward and the arm F' is carried away from the arm E', the screen is lowered by gravity in front of the indicator-wheels to hide their numbers while the wheels are returning to "0" and being moved to the new indication. Upon the screen B', I place the words "No Sale," so that whenever the screen is exposed to view and the wheels hidden those words will indicate that the machine has not been properly or completely operated. Instead of the words "No Sale," the screen might bear the words "Sale not Regis-

tered," "This Should not Show," or like words to call the attention of the customer to any attempted improper manipulation of the machine by the clerk.

A double-toothed pawl G', Fig. 5, co-operates with the gear T and pins I' thereon and with a spring-catch J' in the usual manner to compel a full stroke of the lever U in each direction.

The mode of operation of this much of my machine may be described as follows: In the normal position of the parts—that is, at the end of one operation and preceding the next—the keys H stand in the various positions to which they have been moved at the preceding operation, with the corresponding numbers upon the indicator-wheels exposed to view. The pawls P of the keys are engaged with the upper ratchets of the bars L, the hand-lever U is down, and the parts stand in the position shown in Figs. 2 and 4. The first step in the new operation of the machine is to throw up the hand-lever U to its uppermost position. This will lower the screen-plate B' to a position in front of the indicators and move the bar N to the left, thereby releasing all of the operated keys, which will then be restored to their uppermost position and the indicator-wheels turned to "0." Then the proper keys are pulled downward until their pointers stand opposite the numbers which are to be indicated and registered. Then the hand-lever U is thrown down again, lifting the screen B' to expose the new indication and moving the bar N far enough to the left to engage the ratchet-bar L with both pawls of each key, and thereby positively lock both the operated and unoperated keys from any movement.

It will be understood that the co-operation of the pawls P of the keys with the upper ratchets of the bars L is so far independent of the co-operation of the pawls P' with the lower ratchets of those bars that the one set of ratchets and pawls may be employed without the other. Thus if the bars L had no ratchets upon their inner sides and the keys carried no pawls P' the pawls P would still co-operate with the upper ratchets of the bars to hold the operated keys at the points to which they are moved until released by the upward movement of the hand-lever. In such case the beveled projection Z' upon the arm W would be dispensed with and the nose of the trip Y alone engage the rack-bar V. Without the pawls P' and lower ratchets on the bars L and the projection Z', co-operating with the rack-bar V, the keys would not be locked from movement during the downward stroke of the hand-lever, as they now are; but such locking operation, though desirable, is not essential to the practical use of the machine. It will also be understood that while I have shown the pawls carried by the keys and co-operating with the ratchet-bars as being pivoted to the keys and spring-pressed into engagement with the ratchets, yet this feature of my invention may not be evaded by

the use of fixed pawls or teeth carried by the keys and co-operating with the ratchet-bars in a similar manner. In such case the ratchet-bars could be sufficiently yielding to permit the pawl-teeth to slip over their teeth in one direction, or the bearings of the keys in their guides might be made slightly yielding for the same purpose.

In addition to locking the keys after the hand-lever is started downward I have provided means for locking said lever against downward movement until one or more of the keys H has been moved to make an indication. Upon a rock-shaft K', extending across the machine at the rear of the sectors D, Figs. 3, 4, 6, and 7, are fastened four arms L', one extending forward beside each of the sectors. Each of the arms L' has a notch in its upper side into which fits a pin M' upon the adjacent sector D when the latter is in normal position. When any one of the keys H is pulled downward and the corresponding sector rocked upon its axis, its pin M' will be carried out of the notch in the arm L' and the arm will be pressed downward and the shaft K' rocked forward against the resistance of a spring N', Fig. 4, connected at its lower end to the framework and at its upper end to a screw upon the rear side of the shaft. Fast upon the shaft K', near its left-hand end, Figs. 6 and 7, is an arm O', projecting forward and arranged to co-operate with a shoulder Q' upon a sleeve Q², fast upon the shaft E, which latter shaft, it will be remembered, has fast upon its opposite end the hand-lever U. When the sectors D are all in their normal position, with the indicator-wheels standing at "0," (as they always are when the hand-lever is in its upper position,) and the arms L' upon the rock-shaft K' are in their highest position, with their notches engaged with the pins M', the front end of the arm O' stands immediately behind the shoulder Q', so that the shaft E cannot be oscillated in the direction of the arrow, Figs. 6 and 7, and the hand-lever U is locked from downward movement. When, however, any sector is oscillated by the operation of a key its pin, M' will press down the adjacent arm L' and rock the shaft K' and throw the arm O' out of the path of the shoulder Q', and thereby unlock the hand-lever, as will be readily understood.

I will next describe the means I have provided for preventing downward movement of the hand-lever, (even when released from the lock above described,) except when the pointer of the operated key stands exactly opposite some number upon its adjacent index. The purpose of this is to insure accurate registration by preventing operation of the hand-lever in case the operated key should be left midway between two numbers upon the index. The clerk is thereby compelled to move the key to some number and register its exact value before he can operate the lever. Upon a rock-shaft R', journaled in the framework below the rock-shaft K', above described, Figs.

3, 4, and 7, are fastened four forwardly-extending arms S', one beside each of the arms F of the sectors D. The upper sides of these arms are notched and pins T' upon the sides of the arms F co-operate with the notches. Fast upon the left-hand end of the shaft R', Figs. 1, 3, 6, and 7, is an upwardly-extending arm V', to which is connected the forward end of a spring W', secured at its rear end to the framework and tending to pull the arm V' rearward and throw the arms S' upward. Resting upon the upper end of the arm V' is an arm X', loosely hung upon the shaft K', above and extending forward over the sleeve Q², which is fast upon the shaft E. The forward end of the arm is hooked and arranged to co-operate with a shoulder Y' upon the sleeve Q², Fig. 6. When the pins T' on the arms F all rest in notches in the arms S', the spring W' holds the arm V' and the arms S' in their highest positions, and the upper end of the arm V' then holds the hooked arm X' up out of the path of the lug Y' on the sleeve Q², as in Figs. 6 and 7; but when any sector-arm F is moved to such a position that its pin T' rests upon the top of the tooth between two of the notches in its co-operating arm S', said arm and all of the arms S' will be slightly depressed, as will also the arm V', and the hooked arm X', resting on the latter, will be lowered into the path of the lug Y' and the shaft E and lever U be thereby locked from movement. Now whenever any key is pulled downward and released at a point between two numbers upon its index, (instead of being moved to a point exactly opposite a number thereof,) the pin T' on the sector-arm which is connected with that key will be left resting upon the top of one of the teeth in its co-operating arm S', instead of resting in a notch thereof, the arms S' and V will be depressed, and the hooked arm X' will lock the shaft and lever from movement in the manner above described. It will thus be seen that, in order to operate the lever U after it has been thrown upward to release the previously-operated keys and lower the screen-plate to hide the indicator-wheels it is not only necessary to pull down some one of the operating-keys to make an indication, and thereby throw down the arms L' and rock the shaft K' to carry the arm O' out of the path of the shoulder Q' on the sleeve Q², as before described, but it is also necessary that the operated key shall be moved to and released at a point opposite some number upon its index, so that such number will be properly indicated when the lever is thrown down and the screen lifted.

The lower sides of the pins T' are preferably beveled to an edge, as shown, and their co-operation with the upwardly-pressed notched arms S' aids the operator in moving the key to and releasing it at the proper point, for if the key be released at a point approximately opposite a number the upward pressure of the arms S' will force the operated sector-arm F slightly one way or the other to per-

mit its pin T' to fit in the bottom of the notch with which it may be engaged.

I have provided still another lock for the purpose of preventing the lever U being moved upward to its full limit of stroke until the operated key or keys have been fully restored to their upper positions and the indicators turned to "0." It will be remembered that the bar N is moved to the left by the trip Y and the arm W to release the operated keys at the beginning of the upward stroke of the lever U and rack V and that the keys and sectors are then restored to normal position by the springs S , Figs. 3 and 4. Now it is not until the keys and sectors reach normal position that the pins M' on the latter are brought into position for the notches in the arms L' to engage them, and it is not until these notches are engaged with the pins M' that the spring N' can rock the shaft K' and lift the arm O' , Figs. 6 and 7, into the path of the shoulder Q' on the sleeve Q^2 . As long, therefore, as any one of the keys is displaced from its uppermost position and the pin M' on the co-operating sector remains out of the notch in its arm L' the arm O' will be held out of the path of the shoulder Q' . In such case, therefore, when the lever U was moved to its uppermost position and the shoulder Q' carried in front of the end of the arm O' , the latter would not catch behind the shoulder and the shaft E and lever would remain unlocked and the lever could be thrown down again without first operating any key. It is intended that all of the operated keys shall be immediately restored to their uppermost positions when released at the beginning of the upward movement of the lever Y and rack V ; but it is to guard against any accidental failure of them to do so that the lock to be now described is provided. It consists of an arm Z^4 , Fig. 7, loosely hung upon the shaft K' beside the arm O' and arranged to co-operate with a shoulder Z^2 upon the sleeve Q^2 . This arm rests upon a pin or lug Z^3 , projecting from the side of the arm O' , by which lug its front end is held above the path of the shoulder Z^2 when the arm O' is in its uppermost position, as shown in Fig. 7. It will be remembered that when any key is pulled downward the arm O' is lowered out of the path of the lug Q' to unlock the shaft E and lever U . This lowering of the arm O' , whose lug Z^3 supports the arm Z^4 , will permit the front end of the latter arm to drop upon the top of the shoulder Z^2 . When the lever U is now depressed and the shaft E turned forward in the direction of the arrow, the shoulder Z^2 will be carried from under the arm Z^4 and the latter will drop behind it. The arm Z^4 will remain in this position until the arm O' is again raised by the return of all the keys to upper position in the manner heretofore described, so that until all of the keys are so returned and the arm O' so lifted the arm Z^4 will remain in the path of return of the shoulder Z^2 and prevent a complete backward movement of the shaft E and

upward stroke of the lever U . If, therefore, any key should fail to entirely reach normal position when released at the beginning of the upward stroke of the lever and the operator should fail to notice it, he will find the lever locked from full upward stroke, and since when once started upward it cannot move backward again until given a full upward stroke (because of the double-toothed pawl G' , which co-operates with the gear T , Fig. 5) it will be locked from movement in either direction until the key or keys which have failed to return to normal position are moved to such position.

The registering-wheels A^2 , A^3 , A^4 , and A^5 , Fig. 1, are loosely mounted upon a shaft B^2 , extending across the machine in front of the sectors D and journaled at its opposite ends in the side frames. The hubs C^2 of these wheels on their right sides have clutch-teeth formed on their ends and co-operate with clutch-pinions D^2 , feathered upon the shaft B^2 . These pinions mesh with the respective sectors D and coiled springs E^2 , confined between their right-hand ends, and collars F^2 , fast on the shaft B^2 , yieldingly press their clutch ends into engagement with the hubs of the registering-wheels. When the keys are pulled downward and the sectors moved upward, the pinions carry the registering-wheels around with them to effect a registration of the amount indicated; but as the keys are restored to normal position and the segments moved upward the registering-wheels remain stationary, being held from backward movement by the pawls (not shown) engaging ratchets secured to their left-hand sides. Suitable transfer mechanism, which need not be described in detail, is interposed between the registering-wheels to cause the revolution of each wheel to turn the next higher wheel one number. At the left of the fourth registering-wheel A^5 are two additional registering-wheels A^6 and A^7 , representing, respectively, hundreds and thousands of dollars and actuated by transfer mechanism from the wheel A^5 . Combined with the last wheel A^7 is a locking-lever H^2 , Figs. 6 and 7, which is pivoted to the framework at I^2 and has a hooked rear end arranged to co-operate with the shoulder Z^2 upon the sleeve Q^2 , Fig. 7, heretofore described. The front end of the lever H^2 bears upon the hub of the wheel A^7 , its rear end being pulled upward by a spring J^2 , and said hub has upon it a projection or cam K^2 , Fig. 6. When the wheel A^7 has made nine-tenths of a revolution and brought its number "9" to the reading-point, the cam K^2 upon its hub rides under and lifts the front end of the lever H^2 and throws its hooked rear end down against the shoulder Z^2 , Fig. 7. When the lever U is pulled down and the shaft E and sleeve Q^2 rocked forward, the shoulder Z^2 is carried from under the rear end of the lever H^2 and the hook of the latter catches behind the shoulder. When it is attempted to throw the lever U upward again,

it will be arrested by the engagement of the shoulder Z^2 with the hook of the lever H^2 before it reaches its limit of stroke, and as it cannot be moved downward until it completes its upward stroke it will be locked from movement in either direction. The operated keys having been released and restored to normal position at the beginning of such upward movement of the lever, all of the keys are held locked from movement by the engagement of their pawls P' with the lower ratchets on the bars L , so that the whole machine is locked from further operation. In this manner, when the highest registering-wheel has been turned to its highest number the machine becomes automatically locked.

The right-hand end of the shaft B^2 projects beyond the framework, Fig. 1, and is squared to receive a key, by which the shaft may be turned to reset all of the registering-wheels to "0," suitable resetting devices being interposed between the shaft and registering-wheels for that purpose. The turning of the wheel A^7 to "0" carries the cam K^2 from under the lever H^2 , and the spring J^3 pulls up the rear end of the latter and disengages its hook from the shoulder Z^2 . The lever U can then complete its upward stroke and the operations of the machine be resumed.

The framework of the machine shown in the drawings is intended to be set on the usual base containing a drawer-compartment and money-drawer, and in Fig. 3 are shown the drawer-bolt and the means for actuating it to unlock the drawer. A lever L^2 , pivoted between its ends in the bracket M^2 , has its rear end passed through a slot in the vertically-guided drawer-bolt N^2 , whose lower end extends down into the drawer-compartment into position to engage the drawer or a catch thereon. A gong O^2 is mounted upon a standard P^2 above the front end of the lever L^2 , and a spring R^2 , bearing against the underside of the lever, yieldingly holds its front end up and its rear end down. Pivoted to the lever near its middle is the lower end of a link S^2 , which extends upward to the shaft E , being forked at its upper end to embrace said shaft. Fast upon the shaft E , beside the link S^2 , is a forwardly-projecting arm T^2 , to which is pivoted a plate U^2 , Fig. 3^a. This plate is yieldingly held in the position shown by a spring U^3 and carries upon one side of its lower rear end a cam-lug V^2 , arranged to cooperate with a lug W^2 upon the side of the link S^2 . The rear end of the plate U^2 is held from upward movement by contact with the projecting face of the arm T^2 at U^4 ; but it can be moved in the opposite direction against the pressure of the spring U^3 . When the lever U is thrown downward and the shaft E turned forward in the direction of the arrow in Fig. 3^a, the cam-lug V^2 upon the plate U^2 rides over the lug W^2 and depresses the link S^2 , thereby depressing the front end of the lever L^2 and lifting its rear end and the bolt N^2 to release the money-drawer. When the

lug V^2 passes to the rear of the lug W^2 , the spring R^2 throws up the link S^2 and front end of the lever L^2 and causes the latter to strike and sound the gong. When the lever U is thrown up again and the plate U^2 moved forward, the front end of the lug V^2 engages the beveled rear side of the lug W^2 and passes under the latter, the plate U^2 swinging upon its pivot against the pressure of its spring to permit it to do so. When the lug V^2 has passed to the front of the lug W^2 , the plate U^2 resumes its normal position. (Shown in Fig. 3.)

Under the construction shown in the first seven figures of the drawings and thus far described my machine is designed simply to indicate and register the amounts of the sales; but I can also readily combine with it a printing attachment, by which the amount of each sale may be printed upon a check or ticket to be delivered to the customer, and also upon a permanent record-strip, if desired. In Figs. 8 and 9 I have shown such a printing attachment applied to the machine. As seen in Fig. 8, the indicator-wheels A , instead of being loosely mounted on the shaft B , as before described, are, with the exception of the one on the right, secured upon sleeves B^3 , concentrically mounted upon the shaft B and free to turn independently of each other. The wheel A on the extreme right and its driving-pinion C are fast on the shaft B , (though they, too, might be secured upon a fourth sleeve within the other three,) while the other wheels A and their driving-pinions are fast upon the right-hand ends of the respective sleeves B^3 . Fast upon the left-hand ends of said sleeves are three type-wheels C^3 , the fourth type-wheel on the left being fast on the shaft B , so as to turn with the indicator-wheel A on the right. The second type-wheel from the left turns with the second indicator-wheel from the right, and the third and fourth type-wheels from the left turn, respectively, with the third and fourth indicator-wheels from the right. The left-hand type-wheel represents units of cents and turns with the units-of-cents-indicator wheel, and the second, third, and fourth type-wheels represent tens of cents and units and tens of dollars, respectively, and turn with the corresponding indicator-wheels. The relative positions of the type-wheels and indicator-wheels upon their respective sleeves and upon the shaft B are such that when any number upon an indicator-wheel is brought to the reading-point the same number upon its corresponding type-wheel will be brought to the printing-point.

Immediately beneath the type-wheels is an impression-platen D^3 , carried upon the front end of an arm E^3 , Fig. 9, pivotally supported at F^3 . Fast upon the shaft E beneath the arm E^3 is a cam G^3 , which, when the lever U is thrown downward and the shaft E rocked forward, engages the under side of the arm E^3 and forces the platen D^3 against the type-wheels to effect the printing. The types upon the

wheels C³ may have sharp faces, so as to indent their figures upon the record strip or check interposed between them and the platen, or an inking-ribbon may be passed
 5 between the type-wheels to print the type-numbers upon the check or strip. In Fig. 8 I have shown two inking-ribbon spools H³ arranged upon the opposite sides of the set of
 10 type-wheels and supported upon a plate I³, attached to the framework and having an opening in it immediately above the platen for the passage of the latter, as seen in Fig. 9. Where loose checks are to be printed, this
 15 plate may serve as a guide and support for them as they are inserted beneath the type-wheels. I have shown no means for turning the spools H³ to wind the ribbon from one onto the other; but this may be done in any
 20 convenient way, as by a suitable connection with the platen D³ or shaft E. So I have not shown the permanent record-strip nor the means for supporting the same and feeding it beneath the type-wheels; but as there are many well-known methods of doing this an
 25 illustration and a description of any particular method are not deemed necessary.

It will be understood that where a permanent record-strip is employed in connection with the type-wheels it may constitute the
 30 sole record of the sales made, and the registering-wheels A² A³, &c., be dispensed with, if desired. So the type-wheels may be employed without the indicator-wheels, if desired, and, instead of being secured directly upon the
 35 sleeves B³ and shaft B, they may be independently mounted and be geared to said sleeves and shaft.

While I have shown and described a machine containing four indicator-wheels and
 40 four operating-keys, the principal features of my invention are not restricted to any particular number of keys and associated parts, and either more or less than four may be employed, as desired.

45 Having thus fully described my invention, I claim—

1. The combination of the sectors D, having the curved arms F, and the reciprocating keys or handles H, connected with the arms
 50 F, substantially as described.

2. The combination of the indicator-wheels A, the sectors D, geared thereto and having the curved arms F, and the reciprocating keys or handles H, connected with the arms
 55 F, substantially as described.

3. The combination of the sectors D, having the curved arms F, the inclined guide-rods G, and the keys H, mounted upon said rods and connected with the arms F, substantially
 60 as described.

4. The combination of the sectors D, having the curved arms F, the inclined guide-rods G, and the keys H, mounted upon the rods G, said keys having finger-pieces upon their forward sides and arms I upon their rear sides, said arms I carrying friction-rollers J, bearing
 65 against the sides of the sector-arms F, substantially as described.

5. The combination of the sectors D, having the curved arms F, the inclined rods G, and the keys H, mounted thereon, said keys consisting of a middle body portion carrying friction-rollers bearing against the rods G and a forwardly-projecting finger-piece and having on their rear sides rearwardly-extending
 75 forked arms I, embracing the sector-arms F and carrying friction-rollers J, bearing against the rear sides of said arms F, substantially as described.

6. The combination of the sectors D, having the curved arms F, the reciprocating keys H, connected with the arms F and carrying pointers K, and the indices H', co-operating with said pointers, substantially as described.
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7. The combination of the indicator-wheels A, the sectors D, geared thereto and having the curved arms F, the reciprocating keys H, connected with the arms F and carrying the pointers K, and the indices H', co-operating with the pointers, substantially as described.
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8. The combination of the sectors D, having the curved arms F, the pinions D², driven by the sectors, the reciprocating keys H, connected with the arms F, and the registering-wheels moving with the pinions in one direction but not in the other, substantially as described.
 90

9. The combination of the gear-toothed sectors D, having the curved arms F, the reciprocating keys H, connected with the arms F, the sliding pinions D², meshing with the sectors D and provided with clutch-teeth at one end, and the registering-wheels having hubs provided with clutch-teeth co-operating with those on the pinions D², substantially as described.
 105

10. The combination of the gear-toothed sectors D, having the curved arms F, the reciprocating keys H, connected with the arms F, the shaft B², the pinions D², splined thereon and provided with clutch-teeth at one end, the registering-wheels having hubs provided with clutch-teeth co-operating with those on the pinions D², the springs E², pressing the pinions against the hubs of the registering-wheels, and means for preventing backward movement of the registering-wheels, substantially as described.
 110

11. The combination of the reciprocating keys H, carrying the pawls P, and the ratchet-bars L, co-operating with the pawls P and movable into and out of engagement therewith.
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12. The combination of the reciprocating keys H, carrying the pawls P', and the ratchet-bars L, co-operating with the pawls P' and movable into and out of engagement therewith.
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13. The combination of the reciprocating keys H, each carrying a pawl P and a pawl P', and the bars L, each provided with two ratchets co-operating alternately with the
 130

pawls P and P' and movable out of engagement with one and into engagement with the other.

14. The combination of the reciprocating keys H, provided with the pawls P, the ratchet-bars L, co-operating with the pawls P, means for simultaneously moving the ratchet-bars out of engagement with the pawls P, and springs for resetting the keys.

15. The combination of the reciprocating keys H, provided with the pawls P, the pivotally-supported ratchet-bars L, co-operating with the pawls P, and the bar N, co-operating with the ratchet-bars L to simultaneously swing them out of engagement with the pawls P.

16. The combination of the reciprocating keys H, provided with the pawls P, the pivotally-supported ratchet-bars L, co-operating with the pawls P, the bar N, co-operating with the ratchet-bars L to simultaneously swing them out of engagement with the pawls P, and the springs for resetting the keys.

17. The combination of the reciprocating keys H, provided with the pawls P, the pivotally-supported ratchet-bars L, co-operating with the pawls P and having the bell-crank plates M at one end, the bar N, connected to the plates M, and the spring O for resetting the bar N and ratchet-bars L.

18. The combination of the reciprocating keys H, mounted upon the rods G and provided with the pawls P, the ratchet-bars L, hung upon the rods G and having the bell-crank plates M at one end, the bar N, connected with the plates M, and the spring O for resetting the bar N and ratchet-bars L.

19. The combination of the reciprocating keys H, provided with the pawls P', the ratchet-bars L, co-operating with the pawls P' and movable into and out of engagement therewith, and the bar N, co-operating with the bars L to simultaneously move the same.

20. The combination of the reciprocating keys H, provided with the pawls P and P', the bars L, each provided with two ratchets co-operating with the pawls P and P', respectively, and means for simultaneously moving the bars L into position to engage both of their ratchets with the pawls P and P' and thereby lock the keys.

21. The combination of the reciprocating keys H, provided with the pawls P and P', the bars L, each provided with two ratchets co-operating with the pawls P and P', respectively, means for simultaneously moving the bars L out of engagement with the pawls P and into engagement with the pawls P', and springs for resetting the keys.

22. The combination of the sectors D, having the arms F, the reciprocating keys H, provided with the pawls P and connected with the arms F, the ratchet-bars L, co-operating with the pawls P and movable into and out of engagement therewith, and springs for resetting the keys and sectors.

23. The combination of the indicator-wheels A, the sectors D, geared thereto and having the arms F, the reciprocating keys H, connected with the arms F and provided with the pawls P, the ratchet-bars L, movable into and out of engagement with the pawls P, and springs for resetting the keys, sectors, and indicator-wheels.

24. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F and provided with the pawls P, the ratchet-bars L, co-operating with the pawls P, means for simultaneously moving said bars out of engagement with the pawls, and springs for resetting the keys and sectors.

25. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F and provided with the pawls P and P', the ratchet-bars L, co-operating with the pawls P and P', means for simultaneously moving the ratchet-bars out of engagement with the pawls P and into engagement with the pawls P', and springs for resetting the keys and sectors.

26. The combination of the reciprocating keys H, provided with the pawls, the ratchet-bars L, co-operating with the pawls and movable into and out of engagement therewith, the hand-lever U, and connections between said lever and the bars L for moving the latter by the operations of the lever.

27. The combination of the reciprocating keys H, provided with the pawls P and P', the ratchet-bars L, co-operating therewith, the hand-lever U, connections between said lever and the bars L, operating at one stroke of the lever to move the bars into engagement with both sets of pawls and operating upon the opposite stroke of the lever to disengage the bars from the pawls P, and springs for resetting the keys.

28. The combination of the reciprocating keys H, provided with the pawls P, the ratchet-bars L, co-operating therewith, the bar N, connected with the bars L for simultaneously moving the same, the hand-lever U, connections between said lever and the bar N for moving said bar and the bars L in one direction, and a spring for moving them in the opposite direction.

29. The combination of the keys H, provided with pawls P, ratchet-bars L, bar N, spring O, arm W, rack-bar V, gear T, and lever U.

30. The combination of the keys H, provided with pawls P, ratchet-bars L, bar N, spring O, arm W, trip Y, rack-bar V, gear T, and lever U.

31. The combination of the keys H, provided with the pawls P and P', ratchet-bars L, bar N, spring O, arm W, trip Y, rack-bar V, gear T, and lever U.

32. The combination of the indicator-wheels A, the sectors D, geared thereto and having the arms F, the reciprocating keys H, connected with arms F, the screen-plate B', movable to and from a position in front of the in-

indicator-wheels to alternately hide and expose the numbers thereon, and a lever U for operating the screen-plate.

33. The combination of the reciprocating keys H, movable over indices H', the oscillatory hand-lever U, and a lock for the lever, operating to lock the same when the keys H are all in normal position and thrown out of operation by the movement of any key H from such position.

34. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F, the rock-shaft K', the arms L', fast thereon and provided with notches co-operating with pins M' on the sectors D, the rock-shaft E, having the lever U fast thereon, and the arm O', fast on the rock-shaft K' and co-operating with a stop or shoulder Q' on the rock-shaft E.

35. The combination of the reciprocating keys H, movable over indices H', the oscillatory hand-lever U, and a lock co-operating with the lever U and controlled by the keys H, said lock being thrown out of operation to release the lever whenever the operated key is moved to a point opposite a number upon its index and thrown into operation to lock the lever whenever the operated key stands at a point between two numbers upon its index, whereby the lever is locked, except when the operated key is moved to the proper point to make an exact indication and registration.

36. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F, the rock-shaft E, having the lever U fast thereon, the rock-shaft R', the notched arms S', fast thereon and co-operating with pins T' on the sector-arms F, the arm V', fast on the shaft R', and the hooked arm X', hung on the shaft K' and co-operating with the arm V' and with a lug Y' on the rock-shaft E.

37. The combination of the reciprocating keys H, movable over indices H', the oscillatory hand-lever U, and a lock co-operating therewith and controlled by the keys H, said lock being thrown into operative position by the movement of any key from normal position and thrown out of operative position by the return of all the keys to such position, whereby after one or more keys have been operated and the lever U has been given a stroke in one direction it cannot be given a full stroke in the opposite direction until all of the keys are returned to normal position.

38. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F, the rock-shaft E, having the lever U fast thereon, the rock-shaft K', the arms L', fast thereon and co-operating with pins M' on the sectors D, the arm O', provided with the pin Z³, and the arm Z', hung on the shaft K' and co-operating with the pin Z³ and with a shoulder Z² on the rock-shaft E.

39. The combination of the type-wheels C³, the platen D³, co-operating therewith, the inclined guide-rods G, the keys H, embracing

said rods and reciprocating thereon, and connections between the keys and type-wheels for turning the latter as the keys are moved.

40. The combination of the concentric sleeves B³, the type-wheels C³, fast thereon, the platen D³, co-operating with the type-wheels, the guide-rods G, the keys H, embracing said rods and reciprocating thereon along indices H', and connections between said keys and the sleeves B³ for turning the type-wheels as the keys are moved.

41. The combination of the indicator-wheels A, the type-wheels C³, moving with the wheels A, the platen D³, co-operating with the type-wheels, the guide-rods G, the keys H, mounted to reciprocate thereon along indices H', and connections between the keys and indicator-wheels for turning the latter and the type-wheels as the keys H are moved.

42. The combination of the indicator-wheels A, secured upon the concentric sleeves B³, the type-wheels C³, fast upon said sleeves, the platen D³, co-operating with the type-wheels, the reciprocating keys H, movable over indices H', and connections between the keys H and respective indicator-wheels for turning the latter as the keys are moved.

43. The combination of the indicator-wheels A, the reciprocating keys H, movable over indices H', connections between the keys and indicator-wheels for turning the latter as the keys are moved, the type-wheels C³, turning with the indicator-wheels, the platen D³, co-operating with the type-wheels, the rock-shaft E, and the cam G³ thereon for actuating the platen.

44. The combination of the indicator-wheels A, secured upon the concentric sleeves B³, the type-wheels C³, also secured upon said sleeves, the reciprocating keys H, movable over the indices H', connections between said keys and the indicator-wheels for turning the latter as the keys are moved, the platen D³, co-operating with the type-wheels C³, the rock-shaft E, the cam G³ thereon for actuating the platen, and the lever U for rocking the shaft.

45. The combination of the sectors D, having the arms F, the reciprocating keys connected with the arms F, the type-wheels C³, geared to the sectors D, and the platen D³, co-operating with the type-wheels.

46. The combination of the sectors D, having the arms F, the reciprocating keys connected with the arms F, the indicator-wheels A and type-wheels C³, geared to the sectors D, and the platen D³, co-operating with the type-wheels.

47. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F, the indicator-wheels A, secured upon the concentric sleeves B³ and geared to the sectors D, the type-wheels C³, fast on the sleeves B³, the platen D³, co-operating with the type-wheels, and the cam G³ for actuating the platen.

48. The combination of the indicator-wheels A, the inclined guide-rods G, the keys H, em-

bracing said rods and adapted to reciprocate longitudinally thereon, and connections between the keys and indicator-wheels for turning the latter as the keys are moved.

5 49. The combination of the indicator-wheels A, the guide-rods G, the indices H', the keys H, embracing and adapted to reciprocate lengthwise of the rods G and provided with pointers K, co-operating with the indices H',
10 and connections between the keys and indicator-wheels for turning the latter as the keys are moved.

50. The combination of the indicator-wheels A, the reciprocating keys H, connections between said keys and wheels for turning the latter as the keys are moved, catches for temporarily holding the keys and wheels in the positions to which they are moved to make
15 an indication, means for simultaneously releasing all the catches, and springs for resetting the keys and wheels.

51. The combination of the indicator-wheels A, the type-wheels C³, moving with the indicator-wheels, the platen D³, co-operating therewith, the reciprocating keys H, connections between the latter and the indicator and type wheels for turning the latter as the keys are moved, catches for temporarily holding the keys and wheels in the positions to which they
20 are moved to make an indication, means for simultaneously releasing all the catches, and springs for resetting the keys and wheels.

52. The combination of the sectors D, having the arms F, the reciprocating keys H, connected with the arms F, the indicator-wheels A, geared to the sectors D, the screen-plate B', movable to and from a position in front of the indicator-wheels, a lever U, and connections between the same and the screen B' for
35 operating the latter.

53. The combination of the drawer-bolt N², the lever L², link S², rock-shaft E, arm T², fast thereon, and plate U², pivoted upon said arm

and provided with a cam V², co-operating with the lug W² upon the link S².

54. The combination of the gong O², lever L², link S², rock-shaft E, arm T², fast thereon, and plate U², pivoted upon said arm and provided with a cam V², co-operating with a lug W² upon the link S².

55. In a registering-machine, the combination, with a registering-wheel and a primary moving part of said machine which has to be moved at each operation thereof, of a locking device thrown by the registering-wheel into position to lock such primary part when the wheel has completed a predetermined portion of a revolution, whereby the machine becomes automatically locked when the registering-wheel reaches such position.

56. In a registering-machine, the combination, with a registering-wheel and a shaft which has to be moved at each operation of the machine, of a locking-bar co-operating with said wheel and shaft and moved by the wheel into the path of a projection upon the shaft to lock the same when the wheel has completed a predetermined portion of a revolution.

57. In a registering-machine, the combination, with a registering-wheel provided with a cam and a shaft provided with a shoulder, of a locking-lever movable into the path of the shoulder on the shaft to lock the same and actuated by the registering-wheel to move into such position when the wheel has completed a given portion of a revolution.

58. The combination of the registering-wheel A⁷, having its hub provided with the cam K², the rock-shaft E, having the shoulder Z², and the lever H², co-operating with the cam K² and shoulder H².

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Witnesses:

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